Reconciling behavioural and neoclassical economics

Guilhem Lecouteux

ECOLE POLYTECHNIQUE

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

RECONCILING BEHAVIOURAL AND NEOCLASSICAL ECONOMICS

Guilhem LECOUTEUX

April 2013

Cahier n° 2013-09

DEPARTEMENT D'ECONOMIE
Route de Saclay
91128 PALAISEAU CEDEX
(33) 1 69333033
http://www.economie.polytechnique.edu/
mailto:chantal.poujouly@polytechnique.edu

RECONCILING BEHAVIOURAL AND NEOCLASSICAL ECONOMICS

Guilhem Lecouteux[*]

April 2013

Abstract

The representation of the individual in economics as a rational *homo œconomicus* had been seriously questioned by the development of behavioural economics. Some authors nevertheless argue that economists do not need to produce complex models of human behaviour, since such investigation does not fall within the scope of economic analysis. We show that the mere definition of the scope of economic analysis is quite ambiguous, between on the one hand a conception of economics as a science of individual choice and on the other hand as a science of social institutions: this duality finds its origins during the marginalist revolution with Jevons, Menger and Walras, whose theories seem to be in conflict concerning the scope of economic analysis and the definition of the "economic man". Economists then produced two distinct models of this economic man, one as the simplification of a real individual, and the other as a representative agent. The figure of the *homo œconomicus* developed later by Pareto homogenized these two traditions, leading to the indeterminacy of the scope of economic analysis and *in fine* to the development of behavioural economics. Since behavioural and neoclassical economics are the continuation of these two distinct traditions, we stress that they should be considered as complementary rather than substitute approaches to economic analysis.

Keywords: *homo œconomicus*, marginalist revolution, behavioural economics, economic man, rational choice theory.

JEL classification: B13, B40, D03.

[*] École Polytechnique, Laboratoire d'économétrie PREG-CECO (CNRS UMR 7176), 91128 Palaiseau, France. Email: guilhem.lecouteux@polytechnique.edu

1. Introduction

According to neoclassical economics, human behaviour can be modelled thanks to the rational choice theory, a purely economic theory of behaviour, separate from psychology and sociology, considering the behaviour of perfectly rational agents, who know what their objectives are and how to achieve them. Economists are then continuously torn between two opposite interpretations of this "economic man": on the one hand to interpret it as a fictive and axiomatic entity designed for investigation purposes – such as the study of market equilibrium – and on the other hand to interpret it as the representation of a real individual. We can indeed find a large literature trying to explain a wide range of human actions thanks to the rational choice theory, such as marriage (Becker 1974), criminal activities (Becker 1968) and even obesity and food behaviours (Ruhm 2010). However, the theory does not probably provide an empirically relevant description of individual behaviours in those specific settings: the real individuals can indeed present psychological biases and make decision flaws, unlike the rational agent of the rational choice theory. Behavioural economics indeed produced a large literature showing the existence of numerous and systematic incoherences in the preferences of the individual (see for instance Kahneman and Tversky 2000 and Camerer 2003). Behavioural economists have then suggested leaving the model of a rational *homo œconomicus* as a descriptive model of human behaviour in order to produce more accurate and psychology based models of individual behaviour – an extreme form of this approach is neuroeconomics and the study of the neurological basis of economic

behaviour (Loewenstein *et al.* 2008), but such models probably lose in simplicity and tractability what they gain in empirical validity.

Two main arguments have then been suggested in order to defend rational choice theory and its model of the economic man, but it appears that they are grounded on the two distinct interpretations we mentioned above. Levitt and List (2008) provide a first argument by highlighting a difference between experimentations in the laboratory on isolated individuals and the "settings of interests" of economics:

> "Perhaps the greatest challenge facing behavioral economics is demonstrating its applicability in the real world. In nearly every instance, the strongest empirical evidence in favor of behavioral anomalies emerges from the lab. Yet, there are many reasons to suspect that these laboratory findings might fail to generalize to real markets.
>
> […] To be empirically relevant, the anomalies that arise so frequently and powerfully in the laboratory must also manifest themselves in naturally occurring settings of interest. Further exploring how markets and market experience influence behavior represents an important line of future inquiry." (Levitt and List, 2008, 910)

Since the subjects of an experiment in the laboratory are not in the same conditions than real agents in a market, the individuals will not necessarily behave in the same way depending on whether they are only the subjects of an experiment or real actors in a market. This defence of the neoclassical model, suggested among others by Binmore, considers that experimental findings can only be considered as relevant – and therefore

able to question rational choice theory – if the problem “seems simple to the subjects”, the “incentives provided are ‘adequate’” and the “time allowed for trial-and-error adjustment is ‘sufficient’” (Binmore 1999, p.F17). Binmore indeed stresses that testing economic theory outside this specific framework is not relevant, since “[j]ust as we need to use clean test tubes in chemistry experiments, so we need to get the laboratory conditions right when testing economic theory” (Binmore 1999, p.F17). There is within this first argument the idea that the actual individuals progressively learn to behave rationally: the rational choice theory therefore describes the behaviour of real individuals who have achieved this state of rationality. Behavioural findings are therefore of little interest, since they correspond to deviations from the rational behaviour, and therefore only describe the mistakes the individual can make during this process of “rationalisation”. They do not question the underlying rational behaviour described by the rational choice theory.

The second defence of the neoclassical model of the economic man is put forward by Levine:

> “More to the point – it is crucial to recognize that the goals of psychologists and economists are different, and that is has implications for importing ideas from psychology into economics.
>
> The key difference between psychologists and economists is that psychologists are interested in individual behavior while economists are interested in explaining the results of groups of people interacting. [...] The need to study groups of potentially

> large numbers of people – as I write this we are approaching seven billions – imposes constraints on economic models of individual decision making that are not present for psychologists. Economists need simple and broad models of behavior. Narrow complex models of behavior – neutrally-based descriptions, for example – cannot easily be used to study the behavior of many people interacting. Hence the focus by economists on axiomatic models that provide a reasonable description of particular data while also giving decent results over a broad range of social settings." (Levine, 2012, 125-127)

Levine argues that economists are not concerned with the effective behaviour of isolated individuals, but with the results of human interactions at the scale of the society. It is therefore not necessary to describe the behaviour of a real individual, but of an ideal one, representative of a group of individuals. Economists need then to define a set of axioms that can describe the behaviour of this ideal entity: they generally assume a rational behaviour and self-interested motives, and justify it by appealing to evolutionary considerations (see for instance Alchian 1950). We can also find this kind of argument in the first defence of rational choice theory: there is indeed the claim that the individuals tend to become rational, since they are able to adapt themselves during the repetition of the game. Referring to Lincoln's famous statement that "[y]ou may fool all the people some of the time, you can even fool some of the people all the time, but you cannot fool all of the people all the time", Levine argues that "most people are rational most of the time" (Levine, 2012, 76): there obviously exists individuals who will not be (either some or all the time) rational, but in general, the individuals will behave rationally in society.

Levine's claim is that the *homo œconomicus* does not describe the behaviour of an isolated individual – who can be rational or not – but of a *representative* individual: since most people are rational most of the time, we can approximate the behaviour of a given individual by the behaviour of an "average" one, who is rational. The model of the *homo œconomicus* is therefore relevant because the settings of interest of economics are social institutions, characterized by the interaction of a large number of individuals. Unlike the first argument according to which the actual individuals progressively learn to behave rationally, there is within this second approach the idea that behavioural findings are not particularly relevant towards the issues economists deal with: a model of a representative individual is therefore sufficient for economic purposes.

We have here the perfect illustration of the ambiguous interpretation of the rational economic man: either a real individual in specific settings or a fictive entity designed for the study of the interaction of large number of individuals. Quite interestingly, the authors of both approaches refer to the same kind of argument in order to justify the assumption of rationality: the evolutionary tendency of becoming more rational as long as the game is repeated. However, Binmore's claim is that *each* individual tends to become rational, whereas it would be sufficient in an institutional conception of economics to claim that the *average* individual tends to become rational. If it may be possible that each individual becomes rational in specific kinds of social interaction, such as competitive markets or specific experimental settings, it is not certain that a social outcome which can be represented by the interaction of individually rational agents is effectively the result of the interaction of individually rational agents. However, Levine's argument seems to be

grounded on the identity between those two figures of the economic man as a real agent and as a representative one: he indeed refers to the rationality of the individuals in specific settings to justify the rationality of the representative individual, although the rationality of the representative individual should not be deduced from the behaviour of isolated individuals, but from the structure itself of social interactions between a large number of individuals[1]. If the axiomatic characterization of the representative economic man were deduced from the behaviour of real individuals, then it would not be acceptable that economists use a model of a rational representative economic man when they model social institutions for which the individuals are not individually rational, which is probably the case of marriage for instance.

We can therefore notice that the criticisms of behavioural economics are grounded on the ambiguity of the nature of the neoclassical economic man – as the model of a real individual in specific settings, or as a fictive and representative entity. Indeed, the claim that individuals tend to become rational and can therefore be modelled by a rational representative agent does not support the extension of the scope of economics to the study of human behaviours for which the agents are not individually rational.

In this article, we suggest investigating the origins of this ambiguous definition of the economic man, so that we will be able to properly understand the nature of the opposition between behavioural and neoclassical economics. We will therefore start our

[1] Levine takes the example of the "rush hour game" (Levine 2012, 12-13) – in which each driver chooses a road in order to minimize her time of travel – in order to highlight that the individuals are generally rational. Since – from Levine's own experience – it is apparently not possible to gain time by choosing an alternative road, he concludes that the situation is a Nash equilibrium and argues that it results from the individual rationality of each driver, who used to try alternative roads without success. The rationality of the drivers is however deduced from the property of the whole traffic: it means that the representative driver is rational, but not necessarily each driver.

investigation by studying the origins of microeconomics and of the neoclassical school in the 19th century. We show that the marginalist revolution produced two different conceptions of economics, one as a science of human action, and the other as a science of human activities. It resulted from this duality two different models of the economic man, one as the simplification of a real individual, and the other as a fictive and representative individual. We will then show that those two economic men had been homogenized through the figure of the *homo œconomicus* developed by Pareto. The development of behavioural economics constitutes the logical consequence of the overwhelming place that the paretian *homo œconomicus* took in modern economics, as the model of a representative individual *and* of an actual individual, although it was fundamentally designed for the study of human institutions and not human actions. We conclude by stressing the imperative methodological distinction between both traditions and that economists do not need to share the same model of individual behaviour, since they are not necessarily studying the same range of phenomena.

2. The marginalist revolution and the development of microeconomics

In the 1870's, Jevons, Menger and Walras almost simultaneously and independently published their main work[2], all of them grounded on a subjective theory of value. As underlined by Jaffée (1976), the historiographical practice had then "homogenized" their thoughts, by considering them as the independent discoverers of the marginal utility principle, without paying a closer attention to the differences of their respective

2 Jevons (1871), *Theory of Political Economy*, Menger (1871), *Grundsätze der Volkswirthschaftslehre*, and Walras (1874), *Éléments d'économie politique pure, ou Théorie de la richesse sociale.*

approaches. We will therefore highlight in this section some of the main differences of their works, and in particular their distinct conceptions of the economic man.

2.1 The origins of microeconomics

The main theoretical contribution of the marginalists – by opposition to the classical economists – is the explanation of the value of a good by its exchange value, defined as the ratio of the marginal utilities of the consumption of each good, rather than in terms of labour or any objective measure. The marginalists therefore produced a subjective theory of value, according to which the value of a good is determined by the personal tastes of the individuals, and focused on the phenomenon of the exchange in order to explain the formation of prices and the value of goods. As argued by Hébert (1998), it is probably this shift from macroeconomics to microeconomics that really constituted the paradigm shift between classical and neoclassical economics, more than the growing place of the notion of utility in economics as a motivating factor in human behaviour. His argument is that the need for a *marginal* notion of utility appeared during the industrial revolution, with the development of large infrastructures – such as the railroad –, whose marginal cost was different from the average cost: the real pioneers of the marginalist analysis were therefore engineers, such as Ellet (1839), Dupuit (1844, 1849), and Lardner (1850). Ekelund and Hébert (1999) suggested then that the origins of modern microeconomics are traced back to the works of those engineers – more particularly the French engineers from the Corps des Ingénieurs des Ponts et Chaussées – and that Jevons, Menger and Walras had all been influenced by them. Jevons for instance stated that:

> "To Lardner's Railway Economy I was probably most indebted, having been well acquainted with that work since the year 1857. Lardner's book has always struck me as containing a very able investigation, the scientific value of which has not been sufficiently estimated" (Jevons, [1871] 1965, xviii)

The case of Walras is quite peculiar, since he was very critic of the work of those engineers – and more particularly Dupuit's work – and only recognized his father Auguste Walras and Cournot as sources of inspiration for his work[3]. It seems however that his position was much more due to personal and affective reasons than scientific ones: Cournot was indeed a former classmate of his father Auguste Walras at École Normale Supérieure, whereas he confessed in his autobiography that he had no appetite for the technical details of engineering (Jaffée, 1965, Vol.I, 2). He also failed several times graduating from engineering schools such as École Polytechnique and École des Mines. Those different elements could explain a certain resentment towards French engineers, and the systematic critic of their work: Walras for instance blamed Dupuit for confusing the utility curve (i.e. the marginal utility an individual gets from the consumption of the good) and the demand curve (the willingness to pay the good), since the willingness to pay a good also depends on the personal wealth, as well as the utility

3 In a letter addressed to Jevons (23/05/1874), Walras explicitly stated that the only preceding works that helped him were the ones of his father and of Cournot (Jaffée, 1965, 397). The different letters from and to Walras quoted in this article can all be found in the first volume of Jaffée (1965): we will therefore only mention the pages of the different letters throughout this article.

we get from the other goods[4]. However, Bordas (1847) produced earlier a similar critic, and Dupuit defended his approach by referring to a partial equilibrium analysis: he indeed recognized the influence of the personal wealth as well as the influence of the prices of other goods on the demand, but considered that we can focus on the analysis of a single market, since those different elements do not prevent the existence of a price for each object, each person at each moment (Dupuit, 1849, 184). It seems therefore that Walras criticized Dupuit's work by referring to general equilibrium considerations, whereas Dupuit placed his analysis in a partial equilibrium framework.

In the case of Menger, no obvious link to this engineering tradition exists, since, according to Hayek, he was not acquainted with their works (Menger, [1871] 2007, 14-15) and he also did not explicitly refer to them in the *Grundsätze*. This could partly explain one of the most visible differences between Jevons, Menger and Walras, the use of mathematics: the mathematical tools in economics introduced for instance by Cournot and developed by the engineers are indeed of a great importance in the work of Jevons and Walras, but is lacking in Menger's theory.

However, the main argument of Menger against the use of mathematics in economics was probably on a methodological level. Firstly, his criticism was directed to differential analysis, since it necessitates the specification of continuous utility and demand

4 This criticism is developed in the 41st lesson of the *Éléments d'économie politique pure* (§ 385 to 387) as well as in his correspondence with Jevons (28/02/1877, p.533; 25/05/1877, p.535). Quite interestingly, Jevons recognized that "Dupuit had a very profound comprehension of the subject", unlike Walras who considered that Dupuit's work had little merit.

functions, which are quite unrealistic[5]. He also exposed another criticism in his correspondence with Walras:

> "Allerdings gehöre ich nicht zu des eigentlich Anhängern des mathematischen Methode der Behandlung unserer Wissenschaft. Ich bin nämlich der Meinung, dass die mathematische Methode der Hauptsache nach eine solche des *Darstellung*, der *Demonstration*, und nicht des Forschung ist. [...]
>
> Um was es sich mir bei meinem Forschungen handelt, ist die Zurückführung der complicirten Erscheinungen der Volkwirtschaft auf ihre wahren Ursachen, auf die constitutiven Factoren derselben und um die Erforschung der Gesetze nach welchen aus diesen letztern sich die complicirten Erscheinungen der Volkwirtschaft wieder aufbauen. Die Ergebnisse meiner Forschung können in mathem. Formeln gekleidet werden, mathem. Darstellungen deselben vermögen zu ihrer Demonstration beitragen: die mathem. Methode des Darstellung gehört indess keineswegs zu den Hauptaufgaben, welche ich mir gestellt habe." (Menger to Walras, 28/06/1883, p.768)[6]

5 Karl Menger (1973) – Carl Menger's son – suggested a mathematical specification of the Austrian analysis, and argued that one of the main difference between Menger's analysis and the work of the other marginalists was that his father developed a concept of utility in terms of discrete variables – for which differentiability is not useful.

6 However, I am not one of the true followers of the mathematical methods used in the treatment of our science. My thought is that the mathematical method is mainly a method of *exposition* and *demonstration* rather than of investigation. [...] The object of my research is to reduce complex economic phenomena to their true causes, and to seek out laws according to which these complex phenomena of political economy are repeated. The results of my research may be represented by mathematical formulae. Mathematical representations may help with the demonstrations: however, the mathematical method of representation is in no way the essential part of the task I have undertaken (the second half of the translation is the one of Gloria-Palermo ([1999] 2001, 33)).

Walras considered mathematics as a method of investigation and research (as well as Jevons in the preface of his *Theory of Political Economy* (p.xviii)), while Menger only conferred to mathematics the role of representing the results of an investigation. There is here a crucial distinction between on the one hand the idea that mathematics is only a language, in line with the argument of Samuelson (1947) in favour of mathematical economics, and on the other hand that it can generate independent methods of investigation, such as, according to Boumans (2004), the use of models in economics: this distinction is of a great importance for our investigation, since it already highlights the possible duality of the economic man, as the representation of a real individual or as a fictive and axiomatic individual, defined for investigation purposes.

Hébert (1998) nevertheless argues that Menger's personal library contained several french economic journals – such as the *Annales des Ponts et Chaussées*, the *Journal des économistes* and the *Journal de la statistique de Paris*, in which we can find for instance Dupuit's work – and was therefore aware of this engineering tradition.

Although the development of microeconomics seems to have been initiated by the work of engineers, Jevons, Menger and Walras had a more "scientific" purpose, and tried to establish more general economic principles than the study of specific situations such as the rail-road. We can for instance look at the preface to the first edition of the *Theory of Political Economy*, in which Jevons presents his conception of economics as "a Calculus of Pleasure and Pain" (p.vii), or the discussion of Menger about the place of economics among natural sciences (pp.45-49), and also the explicit distinction of Walras between

science, art and ethics (second lesson), who intended to study in his *Éléments d'économie politique pure* the value of social wealth.

In their attempt of producing a scientific knowledge of economy, they firstly needed to precisely define the scope of their theories, i.e. the type of situations economics as a science is supposed to deal with. This definition was not necessary for engineers whose objective was the study of *predefined* subjects, such as the rail-road, but became essential in the enterprise of producing more general economic principles, without an *a priori* clear scope of validity.

2.2 The scope of economic analysis

An interesting similarity between Jevons, Menger and Walras is that they all had the same ultimate objective, the production of scientific laws of exchange (it is indeed the central element of a subjective theory of value). For instance, Jevons implicitly recognized that the aim of economic theory is the production of laws of exchange:

> "The Theory of Economy thus treated presents a close analogy to the science of Statical Mechanics, and the Laws of Exchange are found to resemble the Laws of Equilibrium of a lever as determined by the principle of virtual velocities." (Jevons [1871] 1965, vii)

Similarly, Menger – defending the legitimacy of investigating economic laws against the argument that human free will does not enable the existence of laws that could determine human behaviour – placed the explanation of exchange at the core of economics:

> "Whether and under what conditions a thing is *useful* to me, whether and under what conditions it is a *good*, whether and under what conditions it is an economic good, whether and under what conditions it possesses *value* for me and how large the *measure* of this value is for me, whether and under what conditions an *economic exchange* of goods will take place between two economizing individuals, and the limits within which a *price* can be established if an exchange does occur – these and many other matters are fully as independent of my will as any law of chemistry is of the will of the practicing chemist." (Menger, [1871] 2007, 48)

This objective was even clearer with Walras, who explicitly recognized that:

> "For my part, I have done my utmost in the present half-volume to give a very thorough account of the *mathematical theory of exchange*" (Walras, [1874] 1956, 36)

The first and probably main difference between their works is that they did not adopt the same strategy in order to study the phenomenon of exchange: while Jevons and Menger tried to explain why the individuals are driven to exchange, Walras studied the exchange itself, and paid little attention to the underlying motives of the individuals.

2.2.1 Jevons and the "lowest rank of feelings"

Several years before the publication of the *Theory of Political Economy*, Jevons argued in a "Brief Account of a General Mathematical Theory of Political Economy" that a theory of exchange can only be deduced from the fundamental determinants of individual behaviours:

> "2. A true theory of economy can only be attained by going back to the great springs of human action – the feelings of pleasure and pain. [...]
>
> 13. We now arrive at the theory of exchange, which is a deduction from the laws of utility." (Jevons, 1866, 282-285)

Jevons adopted an utilitarian perspective by considering that "[his] theory [...] is entirely based on a calculus of pleasure and pain; and the object of Economics is to maximise happiness by purchasing pleasure, as it were, at the lowest cost of pain" (Jevons, [1871] 1965, 23), defining pleasure as "any motive which attracts us to a certain course of conduct" and pain as "any motive which deters us from that conduct" (p.26). Such a definition implies that human action necessarily results from a calculus of pain and pleasure, but it also implies that we cannot homogenize and simply aggregate pleasures and pains, since "a single higher pleasure will sometimes neutralise a vast extent and continuance of lower" (p.27). Therefore Jevons assumed the existence of a hierarchy of feelings, and specifically assigned to economics the study of the actions that result from "the lowest rank of feeling" (p.27), i.e. the accumulation of wealth:

> "Each labourer, in the absence of other motives, is supposed to devote his energy, to the accumulation of wealth. A higher calculus of moral right and wrong would be needed to show how he may best employ that wealth for the good of others as well as himself. But when that higher calculus gives no prohibition, we need the lower calculus to gain us the utmost good in matters of moral indifference. There is no rule of morals to forbid our making two blades of grass grow instead of one, if, by the wise expenditure of labour, we can do so. And we may certainly say, with Francis Bacon [about the riches], 'while philosophers are disputing whether virtue or pleasure be the proper aim of life, do you provide yourself with the instruments of either'." (Jevons [1871], 1965, 27)

Jevons clearly referred to an instrumental notion of reasoning, since he considered that economics should not discuss the ends and motives of the individuals – this is the work of moral philosophers – but only the instruments they use in order to achieve those ends. Jevons, quite similarly to Mill's definition of economics (Mill, [1882] 2009, 1092-1093), isolated a specific economic motive in human behaviour, the accumulation of wealth: economics is therefore defined as the science of human actions undertaken in order to accumulate wealth.

2.2.2 Menger and the satisfaction of human needs

Quite similarly to Jevons, Menger tried to explain the exchange from the behaviour of the individuals:

> "A correct theory of price must instead be directed to showing how economizing men, in their endeavor to satisfy their needs as fully as possible, are led to give goods (that is, definite quantities of goods) for other goods." (Menger, [1871] 2007, 193-194)
>
> "For economic theory is concerned, not with practical rules for economic activity, but with the conditions under which men engage in provident activity directed to the satisfaction of their needs." (Menger, [1871] 2007, 48)

However, unlike Jevons who specified a specific economic motive, Menger attributed to economics the role of explaining the efforts provided by the individuals in order to satisfy their needs, without any limitation on the set of needs economics is dealing with. There is here the idea that the individual is always trying to satisfy her needs and therefore constantly looking for means in order to do so:

> "If we summarize what has just been said we obtain the following propositions as the result of our investigation thus far: The principle that leads men to exchange is the same principle that guides them in their economic activity as a whole; it is the endeavor to ensure the fullest possible satisfaction of their needs." (Menger, [1871] 2007, 80)

Menger therefore defined economics as the science of human actions to which we can associate an instrumental reasoning in general, whatever the ends of the individual are.

2.2.3 Walras and the mathematical theory of exchange

Unlike Jevons and Menger who suggested founding the analysis of exchange on theories of individual behaviour, Walras's purpose was the study of the mechanism of exchange itself. Indeed, in order to define the scope of economic analysis, Walras referred to the notion of *social wealth*, and to the different approaches we can use when we study it:

> "By *social wealth* I mean all things, material or immaterial (it does not matter which in this context), that are *scarce*, that is to say, on the one hand, *useful* to us and, on the other hand, only available to us *in limited quantity*. [...]
>
> I say that things are useful whenever they can be put to any use at all; whenever they are seen to be capable of satisfying a want. [...] Furthermore, we need not concern ourselves with the morality or immorality of any desire which a useful thing answers or serves to satisfy.[...]
>
> I say that things are available to us only in a limited quantity whenever they do not exist in such quantities that each of us can find at hand enough completely to satisfy his desires." (Walras, [1874] 1956, 65)

The determination of the value of the social wealth falls within the framework of science – i.e. the study of the truth – whereas the study of its industrial production is treated in the *Études d'économie politique appliquée* (1898) and of its repartition in the *Études d'économie sociale* (1896). The aim of pure economics is the study of the exchange value of the social wealth, and Walras suggested studying the mechanisms of the market:

> "Things that are valuable and exchangeable are also known as *commodities*. The *market* is a place where commodities are exchanged. Thus the phenomenon of value in exchange manifests itself in the market, and we must go to the market to study value in exchange. [...]
>
> In fact, the whole world may be looked upon as a vast general market made up of diverse spacial markets where social wealth is bought and sold. Our task is then to discover the laws to which these purchases and sales tend to conform automatically. To this end, we shall suppose that the market is perfectly competitive, just as in pure mechanics we suppose, to start with, that machines are perfectly frictionless." (Walras, [1874] 1956, §41)

We can therefore see that Walras represented the society as a vast market where the social wealth is exchanged, and assigned to pure economics the study of its exchange value. In addition, it clearly appears that Walras did not pay attention to the reasons of the exchange: he only observed that exchanges exist, and that they take place in the market. The focus is therefore quite different from Jevons and Menger, who studied a specific range of individual actions: while they were concerned about individual behaviours, Walras was concerned about prices (Peart, 1998, 310). The main difference between their approaches is that Jevons and Menger – beyond their disagreements about the set of motives that could be defined as economic ones – focused on human *actions*, whereas Walras focused on human *activities*. In the first case, the question of the definition of the scope of economics is a matter of human motives, and in the second case it is a matter of institutions.

We have shown in this section that the development of the marginalist thought with the independent and almost simultaneous publication of the works of Jevons, Menger and Walras conferred a more scientific dimension to the microeconomics developed earlier in the 19th century, but that they defined different scopes of analysis for their respective theories, as well as different methodologies for a similar objective. The opposition between Jevons and Menger resulted from the difficulty of defining a clear set of motives to which an economic dimension can be linked, and Walras did not in fact adopt the same approach than the two others, and started his investigation from the simple observation that the phenomenon of exchange exists. In addition, whereas Jevons and Walras referred to the mathematical structure of economics developed by Cournot and the engineers, and also accepted the investigation dimension of mathematics – enabling the recourse to fictive mathematical entities in order to model the economy –, Menger rejected the use of mathematics in economics.

3. Individual behaviour in economic models

In this section, we show that the two approaches adopted by Jevons and Menger on the one hand, and by Walras on the other, generated two different representations of the "economic man", one in the setting of a science of individual choice, and another in the setting of a science of social institutions.

3.1 Economics as a science of individual choice

We saw in the previous section that Jevons and Menger grounded their analysis of the exchange on individual behaviours: they therefore conceived economics as the science of economic *actions*, i.e. a particular range of human actions, to which an economic dimension can be linked. This conception of economics as the study of economic actions can be traced back to Hume's *Treatise of Human Nature*: according to Demeulenaere (1996), Hume initiated an epistemological and methodological tradition in the social sciences that considers the analysis of social phenomena through a non normative approach (p.27). Hume indeed suggested a fundamental dichotomy between the "passions", which determine the motives of any action, and the reason, which is the ability of getting information about the reality. Hume then considered the passions as ultimate facts, and did not recognize to the reason any other quality than the representation of those passions through ideas:

> "Since reason alone can never produce any action, or give rise to volition, I infer, that the same faculty is as incapable of preventing volition, or of disputing the preference with any passion or emotion. [...] Reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them.
>
> […] A passion is an original existence, or, if you will, modification of existence, and contains no representative quality, which renders it a copy of any other existence or modification. [...] 'Tis impossible, therefore, that this passion can be oppos'd by, or be contradictory to truth or reason; since this contradiction consists in the disagreement

of ideas, consider'd as copies, with those objects, which they represent." (Hume [1739] 2000, 266-267)

This representation of the working of human mind generated a specific epistemological tradition in social sciences – and more specifically in economics – in which we do not discuss the ends or tastes of the individuals, but only the means they use in order to satisfy them. We have here the most fundamental characterization of economic actions, the association of an instrumental conception of rationality to this specific kind of actions: a necessary condition for a given action to be considered as an "economic" one is that it results from an instrumental reasoning[7]. Hume's attempt was then to explain the emergence of social norms from the behaviour of individuals who seek to satisfy their interests: Jevons and Menger adopted a similar approach by analysing the exchange – and therefore the research of a common advantage – from the behaviour of the individuals who seek either to accumulate wealth or to satisfy their needs. Similarly to Hume who lead a thorough investigation of the working of human mind, Jevons and Menger were concerned with the accuracy of their model of individual behaviour: Jaffée describes for instance the economic man in Menger's work as "a bumbling, erring, ill-informed creature, plagued with uncertainty, forever hovering between alluring hopes and haunting fears, and congenitally incapable of making finely calibrated decisions in pursuit of her

7 We can however notice a difference between Hume's conception of the reason and the idea of an instrumental rationality. Hume indeed considered that an action is undertaken because there exists a passion that drives the individual undertaking this action, whereas an instrumental conception of rationality implies that an action is undertaken in order to satisfy a passion: the action results in the latter case from an *intention* of satisfying an objective, which is quite different from Hume's theory, according to which the action results from the mere manifestation of the passion – manifestation which can eventually be caused by the exercise of the reason and the discovery of some elements about the world (see Sugden 2006).

satisfactions" (Jaffée 1976, 521). Jevons was also aware of the complexity of the social phenomena[8], and explicitly endorsed Mill's concrete deductive method (Jevons [1871] 1965, 16-17), considering that "we may start from some obvious psychological law, as for instance, that a greater gain is preferred to a smaller one, and we may then reason downwards, and predict the phenomena which will be produced in society by such a law". We can also find some concerns about information issues and the uncertainty of future events in Jevons's work (pp.35-36).

The different authors that continued the works of Jevons – Edgeworth (1881) and Pantaleoni (1889) for instance – and Menger – the Austrian School – then produced more elaborated theories of individual behaviours, but without the will of producing exclusively theories of exchange: unlike Jevons and Menger who suggested a theory of individual behaviour as a mean to explain the exchange, their followers produced theories of individual behaviours for themselves. We can see this shift in the work of Edgeworth, when he stated his "first principle of Economics":

> "The first principle of Economics is that every agent is actuated only by self-interest. The workings of this principle may be viewed under two aspects, according as the agent acts *without*, or *with*, the consent of others affected by his actions. In wide senses, the first species of action may be called *war*; the second, *contract*." (Edgeworth [1881] 1967, 16-17)

8 This is for instance the position of Peart, who argues that "Jevons's view of human behavior is more complex than has been allowed, and has much in common with Menger's predisposition for process, uncertainty, mistakes, and the significance of time in decision making" (Peart 1998, 307).

While Jevons intended to study the exchange of goods, by assuming that the individuals are motivated by the accumulation of wealth, Edgeworth seems to suggest studying any human action guided by the pursuit of self-interest: we can for instance notice that Edgeworth pointed out that the set of economic actions are divided into two categories, war and contract. This definition therefore recognizes apparently non economic activities – as we commonly understand it – as activities to which economic analysis can be applied, and for which neither exchange nor accumulation of wealth is involved.

We can find a similar evolution with Pantaleoni, who suggested defining economics as "the laws of wealth systematically deduced from the hypothesis that men are actuated exclusively by the desire to realise the fullest satisfaction of their wants, with the least possible individual sacrifice" (Pantaleoni [1889] 1898, 3). There is here a will of providing theories of human behaviour, and not only laws of exchange.

This shift from a theory of exchange to a theory of human action is even more obvious in the pursuit of the work of Menger, and especially with the praxeology developed by von Mises:

> "For a long time men failed to realize that the transition from the classical theory of value to the subjective theory of value was much more than the substitution of a more satisfactory theory of market exchange for a less satisfactory one. The general theory of choice and preference goes far beyond the horizon which encompassed the scope of economic problems as circumscribed by the economists from Cantillon, Hume, and Adam Smith down to John Stuart Mill. It is much more than merely a theory of the

> "economic side" of human endeavors and of man's striving for commodities and an improvement in his material well-being. It is the science of every kind of human action. Choosing determines all human decisions. [...] The modern theory of value widens the scientific horizon and enlarges the field of economic studies. Out of the political economy of the classical school emerges the general theory of human action, *praxeology*. The economic or catallactic problems are embedded in a more general science, and can no longer be severed from this connection. No treatment of economic problems proper can avoid starting from acts of choice; economics becomes a part, although the hitherto best elaborated part, of a more universal science, praxeology." (von Mises [1949] 1998, 3)

We have therefore a first tradition in microeconomics in which we study the behaviour of the individuals, and not only the exchanges in which they are involved. Economics is defined as a science of individual choice, i.e. the science of human actions undertaken in order to satisfy some given ends. We can notice that it is mainly on the definition of the set of "economic motives" that the economists from this first tradition disagreed: Jevons only recognized the desire of accumulating wealth as an economic motive, whereas Edgeworth and Pantaleoni extended the set of economic actions to the set of actions undertaken in order to satisfy one's interest; the economists in the tradition of the Austrian school – in the continuation of Menger's work – adopted an apriorist methodology according to which any human action tautologically corresponds to the pursuit of an advantage[9], and therefore to the mobilisation of means in order to satisfy an

9 This idea was already underlined by Aristotle, who stated that "[e]very art and every investigation, and similarly every action and pursuit, is considered to aim at some good" (Aristotle [350BC] 1999, 2), as well

end; and we can also name the possibility of describing any human action *as if* it resulted from an instrumental reasoning and a deliberate calculus of maximization of the advantage, in the line of the methodological principles suggested by Friedman (1953).

3.2 Economics as a science of social institutions

As mentioned above, Hume's analysis initiated a specific tradition in social sciences which considers the behaviour of the individuals through an instrumental view of reason – although Hume did not offer an instrumental theory of rationality – and which tries to explain social phenomena from the behaviour of the individuals. However, there exists another possible approach in order to study the economy, which does not start from the behaviours of the individual, but from mechanisms at the scale of the society: the first author having suggested such an approach is probably Adam Smith, through his analysis of the division of labour. Whereas Jevons and Menger can be situated in the continuation of the methodological tradition generated by Hume's analysis of the individual – although they differed in their characterizations of an economic dimension of human action – Walras is clearly in the continuation of Smith's analysis of the society, since he preferred to study the social wealth through the mechanism of the market and the exchange rather than the behaviour of the individuals. Walras's conception of economics – as the study of the exchange of the social wealth in the whole society, considered as a large market – is indeed quite similar to the one developed by Smith in the *Wealth of Nations*: Smith

as Hobbes, according to whom "of the voluntary acts of every man, the object is some good to himself" (Hobbes 1651, 81-82). The existence of an action presupposed an intention in undertaking this action, and then the existence of a valuable reason from the point of view of the decision maker. The tautological dimension of this proposition led von Mises to consider it as an *a priori* truth.

considered that the value is fundamentally determined by labour, which implies that the study of the wealth of the nations consists in the study of the repartition of the different activities through the division of labour. Smith therefore did not focus on a specific range of economic activities or human actions, but on the repartition of the labour – and therefore of the wealth – in the society. Furthermore, the notion of social wealth in Walras's work integrates the study of non material goods and activities within economics, quite similarly to Smith who considered those activities – such as philosophical or speculative functions (Smith [1776] 1805, 17) – as the product of the division of labour.

Contrary to Jevons and Menger who seemed to initiate a research program according to which economists should produce more and more complex theory of individual behaviour, Walras focused on the market equilibrium, and paid little attention to the behaviour of isolated individuals: the relevant scale of analysis is the society and the aggregation of individual behaviours. Walras therefore did not need to produce realistic or complex model of human behaviour: since the relevant phenomenon from the point of view of the economist is the aggregate behaviour, the individual elements that constitute it are of little importance. We can for instance refer to Walras's discussion about the continuity of the demand curve: Walras considered that its continuity is very unlikely at the individual level, but that it should be true for the aggregate demand (Walras [1874] 1954, §52). If we refer to the discussion about the axiomatic characterization of the economic man mentioned in the introduction, we can here notice that Walras did not try to explain the behaviour of an economic man from the behaviour of a real individual in the market, but from the aggregate demand, i.e. a property of the institution he is studying.

We can also notice a very poor description of individuals' motives in the work of other economists whose object of study was market equilibrium, such as Cournot, who considered the act of exchange as a “natural” and “instinctive” act (Cournot 1838, 2), without further investigation. In addition, he also referred to the aggregative property of the demand function to justify its continuity (Cournot 1838, 52-53). In the *Wealth of Nations*, Smith also provided an elementary description of the motives of the individuals engaged in exchange and argued that their study does not belong to his subject of investigation:

> “This division of labour, from which so many advantages are derived, is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual, consequence of a certain propensity in human nature, which has in view no such extensive utility; the propensity to truck, barter, and exchange one thing for another.
>
> Whether this propensity be one of those original principles in human nature, of which no further account can be given, or whether, as seems more probable, it be the necessary consequence of the faculties of reason and speech, it belongs not to our present subject to inquire. It is common to all men, and to be found in no other race of animals, which seem to know neither this nor any other species of contracts.” (Smith [1776] 1805, 20-21)

We can therefore contrast two different approaches in economics: in the first one, economists try to explain *why* the individuals exchange, whereas in the second one, the

economists start their investigation from the observation that the individuals want to exchange and then try to explain *how* the individuals exchange. It is probably Marshall who presented the most explicit statement of the opposition between those two traditions:

> "It is not true therefore that `the Theory of Consumption is the scientific basis of economics'. For much that is of chief interest in the science of wants, is borrowed from the science of efforts and activities. These two supplement one another; either is incomplete without the other. But if either, more than the other, may claim to be the interpretor of the history of man, whether on the economic side or any other, it is the science of activities and not that of wants [...]
>
> From this it follows that such a discussion of demand is possible at this stage of our work, must be confined to an elementary analysis of an almost purely formal kind. The higher study of consumption must come after, and not before, the main body of economics analysis; and, though it may have its beginning within the proper domain of economics, it cannot find its conclusion there, but must extend far beyond." (Marshall [1890] 1966, 76-77)

We have here the explicit opposition we mentioned above, i.e. on the one hand economists who study the motives (or "wants" for Marshall) of the individual, such as Jevons and Menger, and on the other economists who study human activities, and more broadly social institutions[10]. The characterization of the economic man is quite different

10 It should be noticed that there also existed some tensions in this second tradition concerning the scope of economic analysis: whereas Walras intended to study the social wealth in its totality, Marshall explicitly restricted economics to the study of a precise range of human activities, the ordinary business of life: "Political Economy or Economics is a study of mankind in the ordinary business of life; it examines that

within this second approach: the economists do not need an elaborated theory of individual behaviour, and will therefore refer to a *representative* agent of the group of agents they are studying. A bit paradoxically, it seems that it is Marshall – who defended the view that economists should "deal with man as he is: not with an abstract or 'economic' man; but a man of flesh and blood" (p.22) – who firstly used the notion of a representative agent:

> "So far we have looked at the demand of a single individual. And in the particular case of such a thing as tea, the demand of a single person is fairly representative of the general demand of the whole market [...].
>
> There are many classes of things the need for which on the part of any individual is inconstant, fitful, and irregular. There can be no list of individual demand prices for wedding-cakes, or the service of an expert surgeon. But the economist has little concern with particular incidents in the lives of individuals. He studies rather 'the course of action that may be expected under certain conditions from the members of an industrial group,' in so far as the motives of that action are measurable by a money price; and in these broad results the variety and the fickleness of individual action are merged in the comparatively regular aggregate of the action of many." (Marshall [1890] 1966, 82-83)

> "We shall have to analyse carefully the normal cost of producing a commodity, relatively to a given aggregate volume of production; and for this purpose we shall

---

part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing" (Marshall [1890] 1966, 1).

have to study *the expenses of a representative producer* for that aggregate volume" (Marshall [1890] 1966, 264)

Unlike the research programs of Jevons and Menger, the priority is not here the elaboration of a theory of individual behaviour, but the study of the interactions of large groups of individuals. In this second situation, economics is conceived as a science of institutions, and not of individual choice any more: the phenomenon the economists study is not the determinant of individuals' behaviours, i.e. the reasons why the individuals act, but the interaction between large groups of individuals. From a methodological point of view, it is therefore probably not relevant to produce complex models of individual behaviour which will not be easily tractable for the study of aggregate behaviours. Economists should therefore define "average" agents, presenting only the key characteristics of the group of economic agents they represent: the economic man is therefore not an idealization of a real individual – which would integrate the main features of a real individual – but an idealization of a group of individuals. It is then possible to confer to this representative individual the properties observed at a higher scale, such as continuous demand curves.

The work of Schelling ([1978] 2006) is a good illustration of this tradition: his attempt is indeed to explain observed social outcomes from the behaviour of isolated individuals, who are explicitly designed for the explanation of a specific institution (such as racial segregation). Schelling does not try to explain social phenomena from a unique model of the individual, but designs a specific model of the individual such that it explains a given

social phenomenon: the economic man is conditioned by the institution the economist wants to study.

In this section, we showed that the marginalist revolution produced two different models of the economic man. The first one, initiated by Jevons and Menger, intends to describe the behaviour of actual individuals and is concerned with the determinants of individual choice. The individuals are facing numerous information and cognitive issues, and are supposed to try achieving some given ends. The second model, initiated by Walras, uses a notion of representative individual in order to get a simpler representation of the society, as the interaction between ideal and average individuals. The object of economics is then the study of social phenomena such as the formation of the general equilibrium, i.e. the repartition of the activities in the society.

4. Pareto and the *homo œconomicus*

We can distinguish between two different conceptions of the economic man, according to the objective of the economist: either an institution-based model, which models a representative individual from the characteristics of the institution the economist studies, or an individual-based model, which is concerned with the realism of its representation of the individual. Pareto homogenized these two conceptions with the figure of the *homo œconomicus*: this generated a quite peculiar conception of the economic man as a rational entity trapped in a non rational one, which constitutes the foundation of the current defences of rational choice theory.

4.1 Pareto's science of logical action

By opposition to the works of the early neoclassical authors such as Jevons, Edgeworth and Pantaleoni, Pareto wished to eliminate all psychological interpretation within economics, in order to establish a theory based on principles of rational choice. Pareto recognized that "[c]learly psychology is fundamental to political economy and all the social sciences in general" (Pareto [1909] 1971, Ch.2, §1), and therefore that – in the future – all social phenomena will maybe be deduced from principles of psychology (which can also be deduced from principles of biology, and then from principles of chemistry and physics). Our current lack of knowledge however forces social scientists to adopt an alternative road: Pareto therefore suggested a classification of human actions in order to simplify the scientific analysis of human society. He grounded his classification on the existence or not of a logical connection between the action and the objective of the individual, and if this logical connection is objective or only subjective. Pareto then defined *logical actions* as the class of human actions such that (1) the action is undertaken in order to satisfy a given objective and (2) this action is objectively appropriate towards the objective of the individual. Therefore logical actions "logically conjoin means to ends not only from the standpoint of the subject performing them, but from the standpoint of other persons who have a more extensive knowledge" (Pareto [1916] 1936, §150). Pareto then seemed to define economic actions as the range of logical actions for which the objective of the individual is the satisfaction of her tastes through the purchase of goods:

"We will study the many logical, repeated actions which men perform in order procure the things which satisfy their tastes. [...] Moreover, we will simplify the problem still more by assuming that the subjective fact conforms perfectly to the objective fact. This can be done because we will consider only repeated actions to be a basis for claiming that there is a logical connection uniting such actions. A man who buys a certain food for the first time may buy more of it than is necessary to satisfy his tastes, price taken into account. But in a second purchase he will correct his error, in part at least, and thus, little by little, will end up by procuring exactly what he needs. We will examine this action at the time when he has reached this state. [...]

2. Thus by considering only one part of man's actions and, in addition, by assigning certain characteristics to them, we have simplified the problem enormously. The study of these actions makes up the subject of political economy." (Pareto [1909] 1971, Ch.3, §1)

Nevertheless, he also recognized the possibility of producing economic theories without this specific restriction of motives:

"[S]ince it is customary to assume that man will be guided in his choice exclusively by consideration of his own advantage, of his self-interest, we say that this class [of economic theories[11]] is made up of theories of egotism. But it could be made up of theories of *altruism* (if the meaning of that term could be defined rigorously), or, in general, of theories which rest on any rule which man follows in comparing his

11 Pareto made a distinction between theories on interpersonal and intrapersonal comparisons of utility, and refers in this extract to the second class of theories.

sensations. It is not an essential characteristic of this class of theories that a man choosing between two sensations chooses the most agreeable; he could choose a different one, following a rule which could be fixed arbitrarily." (Pareto [1909] 1971, Ch.3, §11)

Economics seems therefore to be the science of logical actions in general, although Pareto previously restricted the set of economic actions to the pursuit of a specific motive, the satisfaction of one's tastes through the purchase of goods. In the continuation of Mill's epistemological principles, Pareto suggested then the concept of the *homo œconomicus* as the "dimension" of human being which deals with economic actions, by analogy with the study of a concrete body, which can be seen under different perspectives (chemical, geometrical...). Therefore in reality man is an aggregate of all these different dimensions (the *homo œconomicus*, the *homo religiosus*, the *homo ethicus*...) and apart from a few very specific contexts, the behaviour of an actual man is most of the time different from the behaviour of the *homo œconomicus*:

"For certain concrete phenomena the economic side matters more than all the others. In such a case, one can, without serious errors, restrict himself to the results of economic science alone. There are other concrete phenomena in which the economic side is insignificant, and there it would be absurd to restrict oneself to the results of economic science alone. Quite the contrary, they should be disregarded. There are intermediate phenomena between those two types; and economic science will reveal a

more or less important aspect of them. In all cases, it is a question of degree, more or less.'' (Pareto [1909] 1971, Ch.1, §27)

Pareto placed himself in the continuation of the first tradition initiated by Jevons and Menger, since he tried to produce a theory of human action, and defined the scope of validity of economics by a specific set of motives[12]. However, Pareto's objective was the study of social phenomena, such as the circulation of elites, and he had then to characterize this *homo œconomicus* consistently with this objective. He claimed for instance that a psychological description of the individual is not acceptable: the *homo œconomicus* being an abstract entity of pure economics, it will obviously not fully describe the behaviour of a real individual – which is conditioned by psychological and sociological factors – but enables economists to roughly describe the mutual dependence of economic phenomena[13] (Pareto [1916] 1936, §36). Since Pareto's purpose is the study of social institutions – in the *Manual of Political Economy*, he indeed explicitly recognized that the main purpose of his work is the study of economic equilibrium (Pareto [1909] 1971, Ch.3, §14)[14] –, he in fact did not need a psychology-based model of

12 Pareto however seems to oscillate between Jevons and Menger's position, since he argued on the one hand that economic actions are performed towards the satisfaction of one's tastes and on the other hand that the only relevant phenomenon is the satisfaction of one's ends, whatever they are.

13 According to Pareto, if we accept the idea that economics should integrate psychology in order to be more empirically accurate, then there would be no reason to describe economic phenomena only thanks to psychology, since they also depend on geography and more generally on all natural sciences. Pure economics does not have the ambition of explaining all social phenomena, but only a certain part of them, for which the individuals performs logical actions. Since pure economics only needs a theory of logical actions and not of human actions in general, psychology can be removed from economics.

14 We can also notice that Pareto emphasised that economists are studying the behaviour of large number of individuals, and therefore that they should focus on average behaviours, rather than individual ones (see for instance Pareto [1909] 1971, Ch.3, §65-66 and §87).

the individual: the man he suggested to split in different *homines* is not a real individual, but a representative one. Following a logico-experimental method, he argued that the properties of this representative individual should not be characterized *a priori*, but from the observed social phenomena (Pareto [1916] 1936, §55, §63). In particular, the *homo œconomicus* should be described from the properties of the social institution in which the representative individual tries to satisfy her tastes through the purchase of goods, i.e. from the properties of repeated markets.

Similarly to Jevons and Menger – who defined the economic man as the idealization of a real individual –, Pareto identified a specific set of actions for which the economic man offers a good approximation of the behaviour of a real individual, but similarly to Marshall – who defined the economic man as the idealization of a group of individual – he defined the economic man as a representative agent. We have therefore the homogenization of the two distinct models of the economic man: the *homo œconomicus* is indeed simultaneously a representative individual of the market *and* a real individual who learned how to satisfy her tastes. Although Pareto tried to produce a theory of individual behaviour grounded on principle of rational choice rather than psychology principles, his main objective was the analysis of social phenomena: he in fact did not need to produce such a model of individual behaviour, and should have defined a model of a representative agent characterized by the properties of repeated markets.

4.2 *Homo œconomicus* and the economic way of looking at behaviour

The ambiguity of the definition of the neoclassical economic man can be traced back to the paretian *homo œconomicus*. Pareto indeed defined a *homo œconomicus* for the study of institutions, but tried to characterize it from properties of individual choice, such as learning and the discovery of one's own tastes. This ambiguity generated a quite peculiar conception of the economic man as a rational entity "trapped" in a body through which he interacts with the world. The individual – which is nothing more than a computer, "fitting given means to given ends" (Georgescu-Roegen 1971, 343) – can make decision flaws since her body offers her a biased perception of the world: the individual is then supposed to progressively free herself from this non rational body by learning, and economic theory is predicting the behaviour of the rational entity, when she has achieved this state. This idea is indeed explicitly stated by Pareto in his definition of the scope of economics: the repetition of the action enables the individual to learn how to satisfy her tastes, which are supposed to be ordered.

This duality between a rational entity and the real individual is quite salient in the defence of neoclassical rational choice theory through the discovered preferences hypothesis, supported by Smith (1989, 1994) and Plott (1996): it is assumed that the individuals progressively discover what their "true" preferences are, and the theory only predicts the behaviour of an individual who have achieved discovering her true preferences, i.e. of the *homo œconomicus* trapped within her. This specific conception implies that, in any social situation, the repetition of the game enables the individual to get more experience, and *in fine* to perform logical actions and act like the *homo œconomicus*. Since this rationalisation process is not related to a specific institution but to

the mere phenomenon of learning, it seems possible to explain any human action thanks to the rational choice theory, as long as the individuals are able to learn from their past interactions. Economists then removed all psychological considerations from their theories, and, in the second half of the 20th century, started to apply the model of the *homo œconomicus* to explain human actions undertaken outside repeated markets. This was for instance the intention of Becker, who suggested interpreting the *homo œconomicus* as the economic way of looking at human behaviour (Becker 1993).

This conception of the individual – as an *homo œconomicus* who progressively free herself from her non rational characteristics – implies that, if the rational choice theory does not predict the actual behaviour of the individual, then this failure can be due either to the possible falsity of the theory, or to the fact that the individual is not yet in the state in which she knows what her true preferences are. However, it is not necessarily possible to distinguish between those two possible sources of mistake, and the economists will always be tempted to impute the empirical failures of rational choice theory to the non-economic character of the phenomenon the economist is studying, and not to the theory itself. This is precisely the argument used by Binmore in order to question the relevance of behavioural findings: the discovery of anomalies in human behaviour in the laboratory does not question the validity of the theory, since the individuals are not in real economic conditions. This raises the issue of the definition of the scope of validity of rational choice theory as a theory of individual behaviour. We can indeed notice that the set of logical actions is ill-defined: it is not defined by objective criteria such as the purchase of a good, but – if we refer to Binmore's conditions – by criteria such as *adequate* incentives

or a *sufficient* time for trial-and-error adjustments. In particular, even though it is possible to create experimental settings for which the individuals become individually rational, it is not certain at all that those conditions are verified in real markets.

4.3 Rational choice and preference shaping

The representation of the individual as an economic man who progressively becomes rational is grounded on the assumption that learning enables the individual to discover their true and rational preferences. Plott (1996) then argues that repeated markets provide a suitable framework for the discovery of those true preferences. However, the fact that people tend to become individually rational in specific market experiments characterized by learning is not sufficient to deduce that the rationality of the individual is *only* due to the learning effect: there maybe exists a specific process related to repeated markets experiments that makes people rational. Loomes *et al.* (2003) designed for instance an experimental setting in order to show that repeated markets can *shape* the preferences of the individual: even though there can exist a learning effect that helps people to correct their past mistakes, they show that systematic shaping effects occur (Loomes *et al.* 2003, C166).

The crucial point of this distinction is that, in the specific context of repeated market experiments, the "learning" and the "shaping" interpretations of the process of rationalisation lead to similar predictions, but there is no reason to believe that another social institution will shape rational preferences – whereas learning necessarily leads to the discovery of rational preferences. Unless economists can show that the rationalisation of individual preferences in repeated markets experiments is only due to learning and not

to preference shaping – and therefore that learning enables any individual to discover her true preferences in any social situation – it is quite dubious to refer to the model of the *homo œconomicus* to explain human actions outside markets: there is indeed a possibility that the preferences are shaped by the institution itself. This would mean that such "true" preferences do not exist, and therefore that the individuals do not necessarily act according to rational preferences.

Consider as an illustration the Christmas cards institution (Schelling [1978] 2006): individuals can send to each other Christmas cards, mainly as the result of an interactive process "greatly affected by custom and by expectations of what others expect and what other may send, by cards received (and not received) last year and already received this year" (p.31). One of the main features of this institution is that people "feel obliged to send cards to people from whom they expect to receive them, often knowing that they will receive them only because the senders expect to receive cards in return" (pp.31-32). This institution leads to suboptimal results, and "[t]here is no mechanism that would induce people to stop sending cards merely because everybody, like everybody else, deplored the system and wished it would disappear" (pp.32-33). We have here a social institution satisfying the property of learning (the individuals can learn from the past years who is likely to send them a card), but grounded on non rational preferences. We can indeed notice that there exist a significant number of individuals who respects the tradition by sending cards, but who also generally prefer not to send and receive any card. The institution has therefore implemented non transitive preferences, since – after the repetition of the interaction each year – the individuals still prefer to respect a tradition whose disappearance is preferred to its preservation. It implies that the preferences of the

individuals are probably greatly influenced by the institutional framework, and therefore that the phenomenon of rationalisation in repeated markets is maybe more a property of the institution itself of repeated markets than of learning and the discovery of *a priori* and rational preferences. In particular, it is maybe not legitimate to extend the model of a rational *homo œconomicus* to study phenomena *out of the market*, since it is not certain that another institution than repeated markets can shape rational preferences.

Since economists imputed the rationalisation of individual preferences observed in repeated markets to learning, they started to study individual behaviours out of the market, and used an inappropriate model of individual behaviour. The model of a rational *homo œconomicus* – initially thought as a model of a representative individual – was then not empirically relevant, and it became necessary to change the economists' tools: it was therefore "logical" that some economists started to reuse the methodology of the earliest neoclassical authors in order to produce a model of the individual designed for the study of human actions – and not only of the specific institution of repeated markets. This is for instance the position of Bruni and Sugden (2007), who argue that the current opposition between behavioural and neoclassical economics can be interpreted as the re-emergence of the debate between Pareto and the economists from the first tradition – Jevons, Edgeworth and Pantaleoni – about the validity of explaining individual behaviours thanks to axiomatic principles of rational choice rather than psychology based theories. Our claim is that referring to principles of rational choice can be legitimate if we want to characterize a representative individual – under the condition that the actual social outcome can be modelled as the result of the interaction of individually rational agents, such as repeated markets or racial segregation – but is much more delicate if we want to

model the behaviour of a real individual, since the scope of validity of the theory is ill-defined and the preferences can be shaped by social institutions.

The true opposition between behavioural and neoclassical economics is that behavioural economists study the preferences of the individual – which can be rational or not, discovered or shaped – and that neoclassical economists start their investigation from the assumption that the individuals present rational and *a priori* preferences, and then study the interaction of a large number of individuals. The models of individual preferences suggested by behavioural economists, if they are relatively simple, can therefore probably improve the models of social institutions build by neoclassical economists.

5. Conclusion

The main criticisms addressed towards behavioural economics concern its "non-economic" approach. We however showed that the two arguments used against behavioural economics are grounded on two quite different conceptions of economics: one as a science of individual choice, and the other as a science of social institutions. We showed that this duality resulted from the development of modern microeconomics, Menger and Jevons claiming that economics should study *human actions*, whereas Walras and later Marshall argued that economics should study *human institutions*. Both approaches were then developed in parallel, until their homogenization with Pareto and the *homo œconomicus*: Pareto indeed intended to study social phenomena, and simultaneously refer to arguments of both approaches to characterize his *homo œconomicus.* The shift from a model of the economic man grounded on psychology theories to a model grounded on principles of rational choice enabled economists to

widen their field of investigation: since learning seemed to be the phenomenon that enables people to become rational by discovering their true and rational preferences, it was possible to apply this model to the study of any social institution. The proof of the existence of logical actions, for which the individual have discovered their true and rational preferences, is the objective of the proponents of the discovered preferences hypothesis: however, although it seems possible to create experimental settings in which the subjects progressively becomes rational, this objective is pointless, since the assumption of rationality of the representative individual should not be deduced from the behaviour of actual individuals, but from the characteristics of the institution the economist is studying. Furthermore, the rationalisation of individual preferences is maybe also the result of preference shaping and not of learning.

Since the figure of the *homo œconomicus* was designed for the study of economic equilibrium but also offered a tractable model of individual behaviour, economists started to study human actions which were not logical with an inadequate model. This extension of the scope of economics from the study of logical actions to the study of human actions in general implied a need for new economic tools, such that economists could model real individuals and not only the representative individual of repeated markets: the development of behavioural economics – suggesting the introduction of psychology based models of behaviour – was then a logical consequence of this evolution.

Against Levine's claim that behavioural economics is not studying the right range of phenomena, we argue that there do not exist any specific reason to restrict economics either to the study of individual choices or to the study of social institutions: this duality is indeed fundamental in economic analysis, since the first tradition suggests studying the

determinants of individual behaviour – i.e. individual preferences – and the second tradition studies the interaction of large groups of individuals – for given preferences. Economists should therefore refer to the model of human behaviour which is the most adapted to their purpose. In particular, if economists are studying individual behaviours in settings for which they are not necessarily rational, then it seems necessary to provide psychology based theories of individual choice. The assumption that the individuals tend to become rational does not imply that rational choice theory is sufficient to model human behaviour: it only means that rational choice theory is relevant as a theory of individual behaviour in a restricted range of situations – much more restricted than the range of situations with which economists are dealing.

The issue that economists must solve is then the trade-off between the tractability and the empirical validity of their model of individual preferences. Economists concerned with individual behaviours – such as food behaviour or marriage – should therefore refer to complex but realistic models of human behaviour, probably in the vein of neuroeconomics, whereas economists concerned with social institutions – such as the phenomenon of obesity or interracial marriages – should privilege a model of a representative individual, and deduce from the properties of the social phenomenon the preferences of this representative individual. This implies in particular that if we study a specific phenomenon for which the individuals obviously present systematic decision flaws, or which can shape non rational preferences, the representative individual will not necessarily be rational. We can for instance think of the prospect theory (Kahneman and Tversky 1979) as a good illustration of a model combining the tractable structure of rational choice theory and non rational preferences: Kahneman and Tversky identified

within the group of subjects of their experiments a common psychological characteristic, loss aversion; they then use the simple mathematical structure of rational choice theory in order to introduce their experimental findings, and produced *in fine* a relatively simple model of individual behaviour, with a more robust model of preferences. This can therefore constitute an interesting model of representative individual if we study a social phenomenon that could result from the interaction of isolated individuals characterized by loss aversion, or if there is a specific mechanism in the institution that implements loss aversion in the preferences of the individual.

We showed that behavioural economics is in the continuation of Jevons and Menger's work, who wanted to explain *why* people act, and that neoclassical economics is in the continuation of Walras's work, who wanted to explain *how* people interact. There is therefore no reason to oppose behavioural and neoclassical economics: since the former studies preferences, and the latter the interaction of individuals once their preferences are given, they are complementary and not substitute approaches to economic analysis.

References

Alchian, A. A. 1950. "Uncertainty, Evolution, and Economic Theory". *Journal of Political Economy*. 58(3): 211-221.

Aristotle. 1999 [350 BC]. *Nicomachean Ethics*, translated by WD Ross. Batoche Books Kitchener.

Becker, G. S. 1968. "Crime and Punishment: an Economic Approach". *Journal of Political Economy*, 76: 169-217.

Becker, G. S. 1974. "A Theory of Marriage", in *Economics of the family*, ed. T.W. Schultz, 293-344. Chicago: University of Chicago Press.

Becker, G. S. 1993. “Nobel Lecture: The Economic Way of Looking at Behavior”. *Journal of Political Economy*. 101(3): 385-409.

Binmore, K. 1999. “Why Experiment in Economics?”. *Economic Journal.*109: F16-24.

Bordas, L. 1847. “Mesure de l'utilité des travaux publics; réponse à M. Dupuit”. *Annales des Ponts et Chaussées*, 13: 247-284.

Boumans, M. 2004. *How Economists Model the World into Numbers*. London: Routledge.

Bruni, L. and Sugden, R. 2007. “The Road not Taken: How Psychology was Removed from Economics, and How it Might Be Brought Back”. *The Economic Journal*, 117: 146-173.

Camerer, C. 2003. *Behavioral Game Theory*. Princeton: Princeton University Press.

Cournot, A.-A. 1838. *Recherches sur les principes mathématiques de la théorie des richesses*. Hachette.

Demeulenaere, P. 1996. *Homo oeconomicus. Enquête sur la constitution d'un paradigme*. PUF.

Dupuit, J. 1844. « De la mesure de l'utilite des travaux publics ». *Annales des Ponts et Chaussées*, 8: 332-375.

Dupuit, J. 1849. « De l'influence des péages sur l'utilité des voies de communication ». *Annales des Ponts et Chaussées*, 17(1):170-248.

Edgeworth, F. Y. 1967 [1881]. *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences.* New-York: Augustus M. Kelley.

Ekelund, R. and Hébert, R. 1999. *Secret Origins of Modern Microeconomics: Dupuit and the Engineers*. University of Chicago Press.

Ellet, C. Jr. 1966 [1839]. *An Essay on the Laws of Trade in Reference to the Works of Internal Improvement in the United States*. New York: Augustus M. Kelley Reprint.

Friedman, M. 1953. *Essays in Positive Economics*. University of Chicago Press.

Georgescu-Roegen, N. 1971. *The Entropy Law and the Economic Process*. Cambridge (Mass.): Harvard University Press.

Gloria-Palermo, S. 2001 [1999]. *The Evolution of Austrian Economics: From Menger to Lachmann*. Taylor and Francis e-Library.

Hébert, R. F. 1998. “Jevons and Menger Re-Homogenized: Who Is the Real ‘Odd Man out’? A Comment on Peart”. *American Journal of Economics and Sociology*. 57(3): 327-332.

Hobbes, T. 1651. *Leviathan, or The Matter, Forme and Power of a Common Wealth Ecclesiasticall and Civil*. McMaster University Archive of the History of Economic Thought.

Hume, D. 2000 [1739]. *A Treatise of Human Nature*. Oxford University Press.

Jaffée, W. 1965. *Correspondence of Léon Walras and related papers*, Vol. I. North Holland Publishing.

Jaffée, W. 1976. "Menger, Jevons and Walras De-Homogenized". *Economic Inquiry*, 14: 511-524.

Jevons, W. S. 1866. "Brief Account of a General Mathematical Theory of Political Economy". *The Journal of the Royal Statistical Society*. 29: 282-287.

Jevons, W. S. 1965 [1871]. *Theory of Political Economy*, 5th edition. New York: Augustus M. Kelley.

Kahneman, D. and Tversky, A. 1979. "Prospect Theory: an Analysis of Decision under Risk". *Econometrica*, 47(2): 263-292.

Kahneman, D. and Tversky, A., ed. 2000. *Choice, Value, and Frames*. Cambridge: Cambridge University Press.

Lardner, D. 1968 [1850]. *Railway Economy*. Reprint, New York: Augustus M. Kelley.

Levine, D. K. 2012. *Is Behavioral Economics Doomed? The Ordinary versus the Extraordinary*. OpenBook Publishers.

Levitt, S. D. & List, J. A. 2008. "Homo economicus evolves". *Science*, 319(5865): 909-910.

Loewenstein, G., Rick, S., and Cohen, J. D. 2008. "Neuroeconomics". *Annu. Rev. Psychol.*, 59: 647-672.

Loomes, G., Starmer, C. and Sugden, R. 2003. "Do Anomalies Disappear in Repeated Markets?". *Economic Journal*. 113: C153-C166.

Marshall, A. 1966 [1890]. *Principles of Economics*, 8th edition. London: Macmillan.

Menger, C. 2007 [1871]. *Principles of Economics*. Ludwig Von Mises Institute.

Menger, K. 1973. "Austrian Marginalism and Mathematical Economics". In *C. Menger and the Austrian School of Economics*, ed. J.R. Hicks and Wilhelm Weber, 54-60 Oxford: Clarendon Press.

Mill, J. S. 2009 [1882]. *A System of Logic, Ratiocinative And Inductive*, 8th edition. New York: Harper and Brothers.

Pantaleoni, M. 1898 [1889]. *Pure Economics*, translated by T. B. Bruce from the Italian 1889 edition (Florence: Barbera). London: McMillan.

Pareto, V. 1936 [1916]. *The mind and society: a treatise on general sociology*, translated by Andrew Bongiorno and Arthur Livingston. London: Jonathan Cape.

Pareto, V. 1971 [1909]. *Manual of Political Economy*, translated by A. Schwier from the 1927 french edition *Manuel d'économie politique* (Genève: Droz). London: McMillan

Peart, S. J. 1998. "Jevons and Menger Re-Homogenized?: Jaffée after 20 Years". *American Journal of Economics and Sociology*. 57(3): 307-325.

Plott, C. 1996. "Rational individual behaviour in markets and social choice processes: the discovered preference hypothesis". In *The rational foundations of economic behaviour*, ed. K.J. Arrow, E. Colombatto, M. Perlman and C. Schmidt, 225-50. International Economic Association and Macmillan.

Ruhm, C. J. 2010. "Understanding overeating and obesity". *NBER Working Paper* 16149.

Samuelson, P. 1947. *Foundations of Economic Analysis*. Harvard University Press.

Schelling, T. 2006 [1978]. *Micromotives and Macrobehavior*. W. W. Norton and Company.

Smith, A. 1805 [1776]. *An Inquiry into the Nature and Causes of the Wealth of Nations*, 11th edition. London: Pickering and Chatto (Publishers) Limited.

Smith, V. L. 1989. "Theory, Experiment and Economics". *Journal of Economic Perspectives*. 3: 151-169.

Smith, V. L. 1994. "Economics in the Laboratory". *Journal of Economic Perspectives*. 8: 113-131.

Sugden, R. 2006. "Hume's Non-Instrumental and Non-Propositional Decision Theory". *Economics and Philosophy*. 22: 365-391.

von Mises, L. 1998 [1949]. *Human Action. A Treatise on Economics*, The Scholar's Edition. Ludwig von Mises Institute.

Walras, L. 1896. *Études d'économie sociale, ou Théorie de la répartition de la richesse sociale*. Paris: Pichon et Durand-Auzias, Lausanne: Rouge.

Walras, L. 1898. *Études d'économie politique appliquée, ou Théorie de la production de la richesse sociale.* Paris: Pichon et Durand-Auzias, Lausanne: Rouge.

Walras, L. 1954 [1874]. *Elements of Pure Economics*, translated by W. Jaffée from the 1926 Édition Définitive of the *Éléments d'économie politique pure* (Paris: Pichon et Durand-Auzias, Lausanne: Rouge). Norwich: Jarrold and Sons Ltd.